



US006003052A

# United States Patent [19]

Yamagata

[11] Patent Number: 6,003,052

[45] Date of Patent: Dec. 14, 1999

[54] **PORTABLE INFORMATION INSTRUMENT  
HAVING A DISPLAY COVER PROTECTING  
A DISPLAY SCREEN**

[75] Inventor: **Hideto Yamagata**, Tokyo, Japan

[73] Assignee: **NEC Corporation**, Tokyo, Japan

[21] Appl. No.: **08/984,948**

[22] Filed: **Dec. 4, 1997**

[30] **Foreign Application Priority Data**

Dec. 4, 1996 [JP] Japan ..... 8-323240

[51] **Int. Cl.<sup>6</sup>** ..... **G06F 1/16**

[52] **U.S. Cl.** ..... **708/100**; 361/681; 345/905

[58] **Field of Search** ..... 708/100; 361/679,  
361/681, 683; 345/905

[56] **References Cited**

## U.S. PATENT DOCUMENTS

4,589,659	5/1986	Yokoi et al.	364/708.1
4,703,161	10/1987	McLean	364/708.1
4,847,798	7/1989	Kurashima	364/708.1
5,002,184	3/1991	Lloyd	364/708.1
5,200,913	4/1993	Hawkins et al.	364/708.1
5,383,138	1/1995	Motoyama	364/708.1

5,555,157	9/1996	Moller et al.	361/679
5,682,182	10/1997	Tsubosaka	345/905

*Primary Examiner*—David H. Malzahn

*Attorney, Agent, or Firm*—Foley & Lardner

[57] **ABSTRACT**

In a portable information instrument including a housing having an window, and a display screen accommodated within the housing but exposed in the window to display data processed in the portable information instrument, a cover sheet for protecting the display screen is formed of a soft back sheet and a plurality of rectangular hard pieces fixed on the back sheet. An accommodating mechanism is provided within an inside of the housing, and is spring-biased to retract the cover sheet into the inside of the housing. A stopper mechanism is also provided within the inside of the housing, for inhibiting accommodation of the cover sheet into the inside of the housing by the accommodating mechanism. A sensor is provided within the inside of the housing, for detecting passage of the rectangular hard pieces before the sensor, and an information processor located within the inside of the housing, counts a detection signal generated by the sensor, for activating the stopper mechanism when a count value reaches a predetermined value.

**15 Claims, 8 Drawing Sheets**

